

Concerns about the 7.8 -11 eV Cross Section Integral for ^{235}U

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Standards Evaluations

- Evaluations of the standards have preceded each of the versions of ENDF/B so they can be used to convert measurements relative to the standards.
 - These evaluations have also produced data other than the cross section standards.
 - These data in addition to the cross section standards are provided to the CSEWG to use in their general purpose (complete) evaluations. It is recommended that these data be used within their uncertainties.
- Beginning with the standards evaluation for ENDF/B-V the 7.8 to 11 eV resonance integral was introduced as a quantity to be evaluated with the $^{235}\text{U}(n,f)$ cross section data.

Standards Evaluations

- For the standards produced for the ENDF/B-VI and ENDF/B-VII libraries, cross sections integrated over low energy intervals from 150 eV to 15 keV, in addition to the 7.8 to 11 eV interval, have been provided for the $^{235}\text{U}(n,f)$ cross section.
- These integrals can be obtained since some standards measurements cover these energy regions. Thus these integrals are not constants but are used in the evaluation process so they change due to the introduction of new data. The 7.8 to 11 eV integral was 246.5 beV for the ENDF/B-VI standards evaluation and 246.6 beV for the ENDF/B-VII standards evaluation.
- The 7.8 to 11 eV integral for the $^{235}\text{U}(n,f)$ cross section is very important since It has been used to normalize many cross section data sets.
- The value of that 7.8 to 11 eV interval for both the ENDF/B-VI and ENDF/VII ^{235}U files is **2% lower** than the standard value. Apparently the information from the standards evaluation was not taken into account in those resonance parameter evaluations.

Standards Evaluations

- Thus there is an inconsistency between the $^{235}\text{U}(n,f)$ cross sections obtained in the standards evaluation and (at least some) resonance cross sections.
- The $^{235}\text{U}(n,f)$ cross section at thermal for the ENDF/B-VII evaluation agrees with the standards value.
- This inconsistency is no longer present in the new resonance parameter evaluation for the CIELO Project by Leal *et al.* where the standards value was incorporated in their evaluation. The 7.8 to 11 eV resonance integral for the $^{235}\text{U}(n,f)$ cross section in his evaluation is 245.4 beV which is in excellent agreement with the standards value.